Report about the visit to the
Department of Mathematics, UiO-University of Oslo,
for Giuseppe Maria Coclite, Polytechinic University of Bari, Italy

I visited the Department of Mathematics of the University of Oslo from the 22nd of January to the 4th of February. I was a TMS-Guest Professors during the stay, and I was fully supported by the Trond Mohn Foundation through the project Pure Mathematics in Norway. During the stay I collaborated actively with

- Prof. Nils Henrik Risebro
- Kenneth Hvistendahl Karlsen

that are both members of Department of Mathematics of the University of Oslo. Our scientific activity mainly focused on fluid-dynamic traffic models. We started our analysis at the discrete level and deduced a continuous model, that consists of a conservation law with a nonlocal flux. We studied the convergence of the solutions of the model to the entropy ones as the nonlocal kernels tend to a Dirac delta.

On 01-02-2023 I delivered the seminar "Adhesion and decohesion in a thermoelastic continuum". Motivated by a cryogenic process for the recycling of photovoltaic crystalline modules, I presented a model that describes the evolution of the temperature and displacement fields in a one dimensional string attached to a rigid substrate through an adhesive layer. This adhesive interaction is characterized by a nonlinear term describing the adhesion force exhibiting discontinuities when a critical value of the displacement is reached. I studied the well-posedness of the problem under Neumann boundary conditions in the Fourier regime of heat propagations and investigated the long time dynamics. The talk was based on joint works with N. De Nitti, G. Devillanova, G. Florio, M. Ligabò, F. Maddalena, G. Orlando, and E. Zuazua.